

HOW TO GET THE BEST FROM THE IMMUNOLOGY LABORATORY WHEN TESTING FOR ALLERGY

Goal:

An allergy blood test is designed to detect and measure circulating IgE antibodies directed against specific allergens. The purpose of this article is to guide clinicians on how best to use allergen specific IgE testing for different clinical scenarios to get the most valuable information in order to help their patients.

Terminology:

The first test available evaluated used radiolabelled anti-IgE and was called the radioallergosorbent test (RAST). The RAST test has now been superseded by modern day enzyme immunoassays. The term "*RAST*" has become an colloquialism for these tests, but is now a misnomer and the phrase "*allergen specific IgE*" is preferred.

Sensitisation vs. allergy:

It is important to note that the presence of allergen specific IgE does not make a diagnosis of 'allergy' and a negative test does not necessarily exclude 'allergy'. Individuals may have positive specific IgE to common food and environmental allergens but be asymptomatic on exposure, i.e. they are not clinically allergic. Conversely, specific IgE may be negative for some allergens (particularly fruits, vegetables, latex and drugs) but cause symptoms on exposure. Thus the aim of allergy testing must be tailored to the clinical scenario.

Choosing allergen specific IgE tests:

Indeed, clinical history is the most important factor when considering allergen specific IgE testing. Where clinical history informs requests for specific allergens, allergen specific IgE testing offers accurate, easy to interpret and reliable results in the majority of cases. Since there are numerous allergens in every patients environment, pointers from the patients history and known exposures are essential in narrowing down which specific tests to order.

Where possible testing for single allergens (rather than allergen mixes) is recommended. Allergen mixes have limited utility except to 'rule out' allergic disease in people with a low pre-test probability. Allergen mixes are less sensitive with higher rates of false negatives than the individual tests and therefore selection of specific allergens often provide more useful clinical information. However allergen mixes may be useful for aeroallergens where sensitivity is higher.

A request for "RAST" without specifying the clinical scenario or specific allergens to be tested does not make best use of the Immunology laboratory as it is not feasible, nor relevant to test for the hundreds of potential allergens for every patient. The following sections are therefore intended to give some advice regarding particular allergens that may be useful to consider, based on the clinical scenario.

Seasonal Rhinitis/Perennial Rhinitis or Asthma

Taking a history of specific triggers (e.g. on exposure to pets, when doing housework, on entering dusty houses etc.) is often useful in identifying the specific allergic triggers. For seasonal respiratory allergic disease it is often helpful to request specific IgE tests for grasses, weeds and trees. For perennial respiratory allergic disease it is often helpful to request specific IgEs for grass pollens, house dust mite, moulds and any pets that the patient owns. Often patients will have a mixture of these patterns of symptoms in which case all of the above are best requested.

If clinical details suggestive of allergy to aeroallergens are provided (e.g. rhinitis, Hayfever, asthma, chronic cough) without specific IgEs requested then a panel of specific IgE against common aeroallergens including grass, house dust mite, moulds and animals will be performed.

Anaphylaxis:

Anaphylaxis is a severe systemic allergic response involving airway / respiratory / cardiovascular system involvement, often together with milder allergic symptoms such as urticaria, cutaneous angioedema and gastrointestinal upset. Common causes include:

- Food
 - Milk, eggs, peanuts, tree nuts, sesame, wheat, soy, fish and shellfish are the most common food triggers although any food may potentially cause allergies.
- Insect Sting
 - Bee, wasp and jack jumper ants are the most common cause of anaphylaxis to insect stings.
- Medications

Medications, both over the counter and prescribed can cause severe allergic reactions.
However, availability of specific IgE testing to drugs is limited and negative blood tests do not necessarily exclude allergy.
- Latex
 - Natural rubber latex allergy may cause allergic reactions

We recommend that specific IgE be requested for the specific triggering agent identified on the clinical history as the most likely trigger.

Please note that specific IgEs may be falsely negative for up to 6 weeks following an acute event and may need to be repeated if negative or the patient referred for skin testing.

If clinical details of 'anaphylaxis' are given but no specific triggers are identified or specific IgE are requested then the specimen will be stored pending request for the specific allergens.

Food Allergy:

IgE mediated allergy to milk, eggs and peanuts tends to be more common in children whereas peanuts, tree nuts, fish and shellfish are more commonly associated with adults although any food may potentially cause allergies. Broad food panels have been shown to have false positive rates higher than 50%, i.e. in half of cases positive results have no relevance and these large panels should not be used for screening. Instead testing should be limited to relevant foods based on the clinical history. There is not enough evidence to recommend routine food allergy testing before introducing highly allergenic foods (such as milk, egg, and peanut) to children who are at a high risk of reacting to these foods.

If clinical details of 'food allergy' are given but no specific foods are identified or specific IgE are requested then the specimen will be stored pending request for the specific allergens.

Acute Urticaria:

Acute urticaria is a common disorder that often is uniphasic and an allergic / IgE-mediated trigger may not be identified. In children between 40 to 60% of cases of acute urticaria are related to viral infection and testing for specific IgE in the absence of a suggestive allergic trigger is unlikely to be helpful.

In the cases where there is a possible, identifiable precipitant, allergen specific IgE testing may be helpful. A detailed clinical history regarding possible causes of acute urticaria should guide requests for allergen specific IgE.

If clinical details of 'urticaria' are given but no specific IgE is requested then the specimen will be stored pending request for the specific allergens.

Chronic Urticaria:

Chronic urticaria is defined as urticaria that occurs every day for greater than 6 weeks. In contrast to popular belief, this condition is rarely (less than 1%) due to allergy. Specific IgE testing for specific allergens is therefore **not routinely indicated** in this condition. Useful investigations to rule out underlying treatable conditions that may cause chronic urticaria include a full blood picture, ESR, CRP, IgE, C3, C4, thyroid antibodies, thyroid function and Helicobacter pylori serology. These investigations are abnormal in less than 5% of patients with chronic urticaria, with the majority of patients remaining "idiopathic" and requiring symptomatic therapy only.

Atopic Dermatitis:

Atopic dermatitis is primarily a defect of the skin barrier with atopy occurring as a consequence, rather than a cause of this disorder. Patients with atopic eczema are predisposed to developing respiratory allergic disease and food allergies, however avoidance of specific allergens and specific treatment of allergic sensitisations (e.g. desensitisation) have only subtle benefits in a small number of selected individuals. Specific IgE testing is therefore only indicated in severe cases to define allergic cofactors in cases that are not responding to conventional therapy (moisturisation + regular topical corticosteroids to active lesions). Definition and management of allergic cofactors in severe atopic dermatitis should be performed in conjunction with an allergy specialist.

If clinical details of 'atopic dermatitis' or 'eczema' are given but no specific IgE is requested then the specimen will be stored pending request for the specific allergens.

Take home messages:

"Allergen specific IgE" is the preferred term for allergy blood tests and has superseded "RAST"

Patient history remains the most useful tool in assessing allergy and requests for allergen specific IgE should be targeted to the clinical question

Requests for allergen specific IgE without specifying particular allergens or without clinical details will not be processed – serum will be stored pending further information from the clinician

If you are uncertain as to which allergens to request then please contact the PathWest Immunology Laboratory at QEII Hospital and one of the Immunopathologists would be happy to help provide clinical advice.